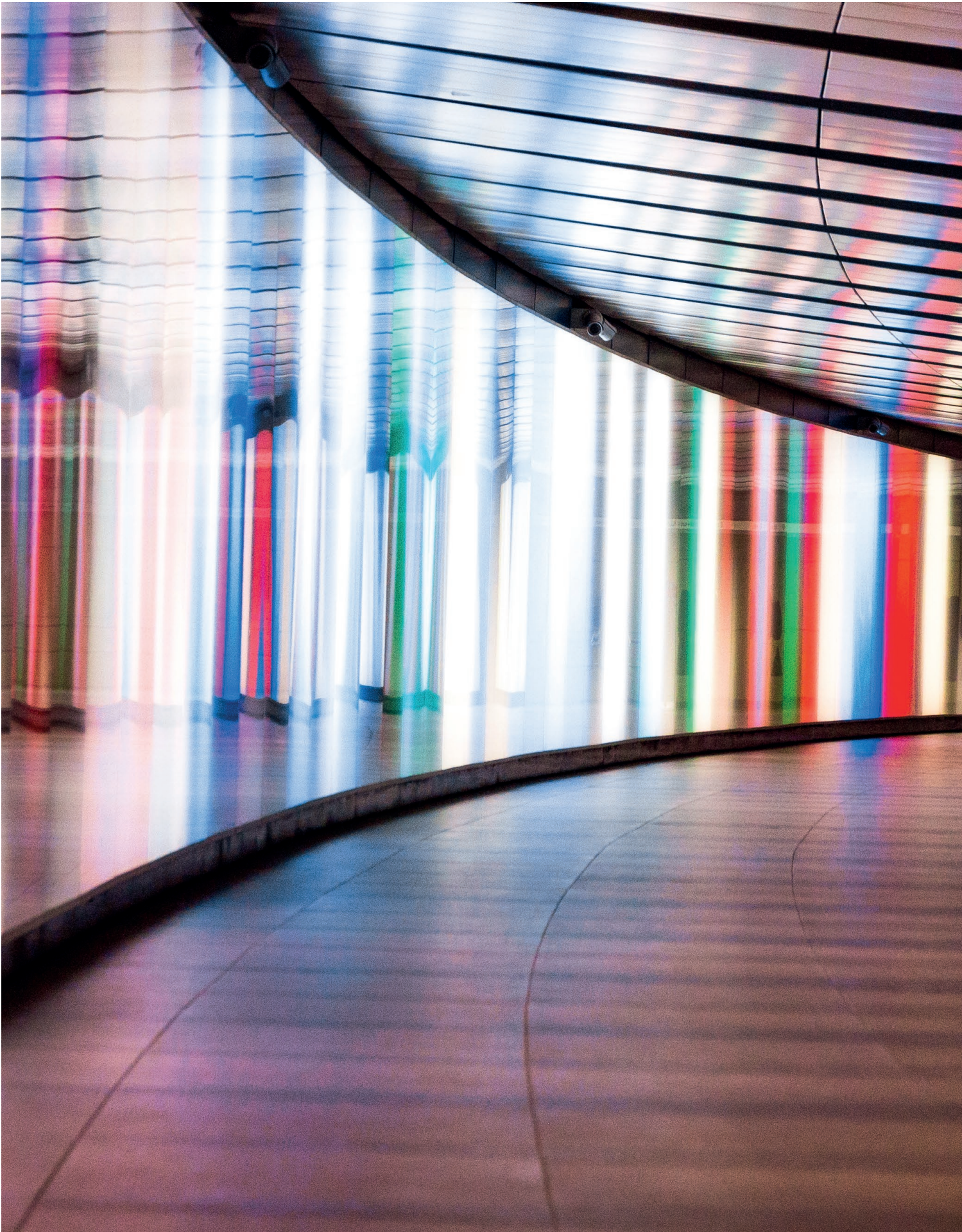


Next Generation  
Treasury Management:  
From Industry 4.0  
to Treasury 4.0











# Next Generation Treasury Management: From Industry 4.0 to Treasury 4.0

The Fourth Industrial Revolution, or Industry 4.0, is fostering innovation across all sectors by combining the skills of humans and intelligent machines to deliver process efficiencies, data-driven insights, and new growth opportunities. Fundamentally altering the way we work and interact, Industry 4.0 technologies are also powering a new breed of treasury management solutions and strategies, marking the advent of Treasury 4.0.

Industry 4.0 is changing the way businesses operate and compete. Without a robust understanding of the challenges and opportunities that Industry 4.0 – and importantly Treasury 4.0 – brings, companies risk losing their competitive edge.



## What is Industry 4.0?

In an exclusive interview with HSBC's David Andrada – Global Sector Head, Natural Resources & Utilities, Global Liquidity and Cash Management, HSBC, and TMI, Moshe Vardi, an award-winning Professor of Computer Science at Rice University, explained the origins and impact of Industry 4.0: "The Fourth Industrial Revolution is a term coined by Professor Klaus Schwab, Founder and Executive Chairman of the World Economic Forum. Far more than just a 'buzzphrase' the Fourth Industrial Revolution is impacting economies and industries, as well as challenging ethics and, ultimately, humanity itself."

As Vardi summarised, "The First Industrial Revolution began in the 1760s and used water and steam power to mechanise production, notably in the textiles industry. The Second Industrial Revolution started in the 1870s and leveraged electric power to create mass production. We also saw trends such as the rise of the automobile, and societal shifts such as urbanisation.

"The Third Industrial Revolution began in earnest in the 1960s and saw electronics and information technology

start to automate production. Now, the Fourth Industrial Revolution, or Industry 4.0 is here. This is an era of hyper-connectivity that is driving convergence between the physical and digital worlds, to create new ecosystems, and new ways of working – by combining the power of machines and humans."

Some of the many technologies that are driving the Fourth Industrial Revolution include: the Internet of Things (IoT); Robotic Process Automation (RPA); Open Application Programming Interfaces (APIs); Distributed Ledger Technology (DLT) or blockchain; Artificial intelligence (AI) and Machine Learning (ML); big data and advanced data analytics; cloud computing.

Andrada also commented the impact from a Corporate Treasury perspective, "The access to technology and hi-tech tools are now readily available and no longer a concept of the future. For Treasurers, this means they can be creative in co-creating solutions for day to day operational based situations leading Innovation and Disruption"





As such, treasurers must look beyond the hype towards practical, real-world applications of disruptive technologies (see box 1) within the treasury function. This was precisely the aim of HSBC Global Liquidity and Cash Management's Third Annual Natural Resources and Utilities Treasury Forum, held in February 2019 in Houston; helping over 100 corporate attendees to understand how Industry 4.0 technologies can lead to Treasury 4.0 – a smart, next generation treasury function.

As Lance Kawaguchi, Managing Director, Global Head – Corporates, Global Liquidity and Cash Management, HSBC, explained in his opening remarks, "Industry 4.0 will have impacts far beyond the production line – changing the entire business landscape and redesigning humans' role within it. This applies to treasury too – Treasury 4.0 is coming. And next generation treasury functions will be: automated, data-driven, real-time, forward-looking, and increasingly strategic."

While cash and liquidity management has been considered a 'commoditised' activity in the past, Kawaguchi also said that "Innovative solutions resulting from Industry 4.0 are creating a set of new dynamics that could transform cash and treasury operations, as well as liquidity and risk management strategies."

#### Case in point

To illustrate the power of Industry 4.0, Drew Douglas, Regional Head of HSBC Global Liquidity and Cash Management, North America, then took to the stage to explain how HSBC has been using disruptive technologies – to the benefit of the bank and its customers.

"The evidence of remarkable technological change runs across all aspects of our lives and as leaders in our respective industries, we are tasked with navigating the complex changes

and embracing those that can transform our contribution to our organisations," noted Douglas.

"At HSBC, we realise the importance of re-engineering legacy processes and embracing innovation – which is why we are already utilising robotic process automation. A great example is THOR (The Hybrid Operations Robot), which we use for information aggregation and extraction, as well as data reconciliation, thereby enabling a smart digital workflow. It supports automation for both structured and unstructured data."

There are numerous use cases for THOR: it has enhanced wire processing in the bank's Global Markets business, making high volume payments flow more swiftly. In Global Liquidity and Cash Management, THOR has freed up client service staff from manual and repetitive work, empowering them to spend more time directly servicing clients. In fact, during the development of THOR, "The client services team provided on-the-ground insight around opportunities to better serve clients, demonstrating that THOR is a collaboration between people, process and technology."

Further use cases for THOR are constantly being identified and explored across the bank. As Douglas commented, "It is important to treat this as a continuous improvement journey. Technology keeps evolving, as does the world around us. So, sustained transformation efforts and investments will be required – this is true for banks and corporate treasury functions," he said.

"As such, we will continue to collaborate with our clients, helping them to keep pace, and eventually stay ahead of, evolving technology to create value" Douglas concluded.

## Key learnings from HSBC's robotics journey

- ◆ **Fear of the unknown is one of the most significant barriers** to digital transformation. It is time to stop thinking of robotics as a 'sci-fi' tool of the future. Robotics is a tangible, practical tool that leading-edge organisations are deploying today. And it is rapidly changing the way these organisations carry out manual, high-volume, repetitive processes – for the better.
- ◆ **Technology is only one piece of the puzzle.** People bring the insight and inspiration, as well as the instinct that machines lack. But, to enable the journey, new skill sets and an inquisitive mindset are required.
- ◆ **Organisations must hire and develop the right talent** to harness the true power of technology. This means addressing imbalances in generational diversity across the organisation – including the treasury function.





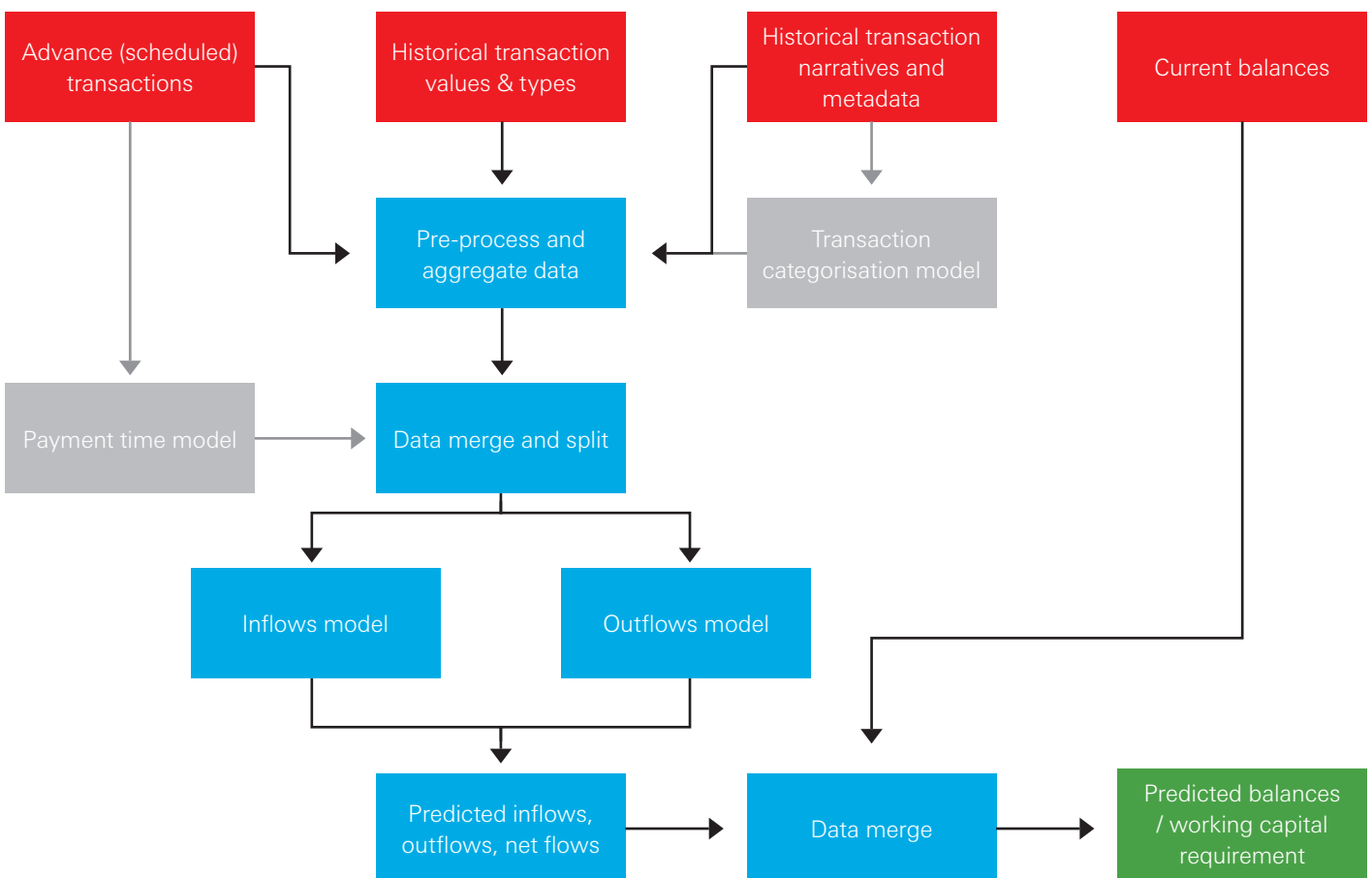
### Intelligent solutions

Another way that banks are looking to innovate and help customers take advantage of new technologies is through collaboration with fintechs. Rajiv Shah, Data Scientist at DataRobot, was invited to present to the audience on opportunities arising from artificial intelligence (AI).

“Tools such as AI and machine learning (ML) enable computers to look through your data and find patterns much more quickly and efficiently than humans could – also taking into account far more characteristics of that data. AI and ML also have the ability to replace rules-based systems altogether, in order to automate decision-making, or to vastly improve it, he said.” The impact of this on productivity should not be underestimated, he warned, quoting a Gartner prediction that AI will generate \$2.9tr. in business value and recover 6.2bn hours of worker productivity by 2021.

Shah went on to explain how, in the oil and gas industry, AI or ML could be applied in any number of use cases – from identifying new customers to predicting the future production level of an oil well by analysing historical production data in new ways. He then outlined how some treasurers are using AI to improve cash flow forecasting.

The starting point is to analyse past data, categorise incoming payments, and identify payment behaviours, he said. Outgoing payments can also be analysed in a similar way – although these are typically much easier to predict. By building a model for the incoming payments and a separate model for the outgoing payments, and combining the two, treasurers can then bring their current bank account balances – across multiple banks – into the equation. Off the back of this, treasury should be able to achieve an accurate cash flow forecast and consider new ways to free up working capital (see Figure 1).



Finally, Shah shared another use case, around how ML can improve fraud detection. “Fraud is typically handled by simple rules of thumb. We know certain types of transactions are likely to be fraudulent. These rules of thumb are a great place to bring in machine learning. You keep humans in the loop, but by adding a simple predictive model that learns what is fraud and what isn’t, companies can achieve much better performance in terms of detecting fraud and lowering their false positives,” he explained.

“In addition, we can also use AI for anomaly detection – essentially flagging up those transactions that appear normal but are actually unusual. The computer identifies the anomalies and alerts a human to make a decision on the matter, giving the investigation team higher quality information in a much shorter timeframe,” he explained.

“These are all concrete ways that AI and ML can add value to the organisation – which is ultimately what Industry 4.0 and Treasury 4.0 are all about. But to make the most of these technologies, it is important to truly understand the challenge you are looking to solve and be sure that it really matters to the organisation – not just to your department,” he cautioned.

## Leapfrogging Treasury 3.0

Next to take the stage was Sri Vishwanathan, Director, Treasury Transformation and Technology, HP Inc, who presented highlights from the organisation's treasury transformation journey which began in 2016 once HP split into HP Inc (HPI) and HP Enterprise (HPE). "We are currently functioning at around the Treasury 2.0 level, extending towards 3.0, but we definitely want to reach the Treasury 4.0 level," he said, explaining the rationale for the transformation work.

"Our transformation journey started with understanding what our strengths and weaknesses were and identifying our pain points from a people, process and technology standpoint.

To our credit, we already had a relatively centralised treasury structure in place, with regional hubs in the Americas, EMEA and Asia Pacific/Japan. Our in-house bank was pretty sophisticated too and we had a TMS in place. Nevertheless, there were still a number of gaps," noted Vishwanathan.

From this gap analysis, HPI identified four key drivers for its treasury transformation journey:

Key Driver	Goal
Banking Structure	<ul style="list-style-type: none"> <li>◆ Simplify and standardise banking structure</li> <li>◆ Consolidation of bank relationships and reduce bank accounts</li> <li>◆ Generate bank fee savings</li> </ul>
Bank Connectivity	<ul style="list-style-type: none"> <li>◆ Standardised and consistent bank communication mechanism</li> <li>◆ Implement SWIFT connectivity</li> </ul>
Cash Management	<ul style="list-style-type: none"> <li>◆ Better liquidity management through timely availability of forecast information</li> <li>◆ Achieve 100% cash visibility</li> <li>◆ Reduce operating balances and optimise investments</li> </ul>
Operational Risk	<ul style="list-style-type: none"> <li>◆ Secure System integrated with ERP</li> <li>◆ Automation of manual processes</li> <li>◆ Mitigate downtime and end of life risk</li> </ul>





“These drivers became the basis for our transformation business case, with management buying in to the potential for bank savings, more efficient investment management, increased interest income, reduced risk, and lower compliance costs.

With the relevant investment secured, we decided to organise our transformation programme into three pillars:

#### **1. Bank Rationalisation.**

To consolidate our bank relationships and optimise our bank account structure.

#### **2. Treasury Management System upgrade.**

To achieve greater automation, institute best-in-class processes and achieve a single source of truth for treasury master data and transactional data – connecting the TMS to the ERP.

#### **3. SWIFT connectivity for key banks.**

To standardise reporting and payments using the bank-agnostic SWIFT network. We also wanted to standardise the cash application process and accounting, as well as instituting advanced payments processing and monitoring mechanisms.

“At present, circa 75% of the bank rationalisation project is complete; there are further opportunities ahead. We are currently in the process of implementing SAP as our new TMS, which we are tackling through four releases, and we are now on release three. In addition, we are connected to 80% of our bank accounts via SWIFT, but we still have a handful of smaller banks that don’t support our connectivity requirements.”

Looking ahead, therefore, the bank rationalisation exercise will continue, with a focus on choosing relationships that can help HPI derive greater value from its banking set-up, within a standard connectivity model. “We will also be looking at some next generation technologies that banks are offering like virtual accounts, along with payments on behalf of (POBO) and collections on behalf of (COBO), and cashless intercompany netting.”

Another part of the transformation journey is embracing robotics and analytics, so HPI will be looking to leverage RPA to automate routine treasury processes, create common analytical reports and assist with future state analytics. Slightly further ahead, perhaps three years out, Vishwanathan may more seriously consider solutions powered by blockchain/ distributed ledger technology (DLT), machine learning, and data science/predictive modelling – “and we have a team looking at the possibilities of Industry 4.0 technologies to improve cash forecasting,” he notes.

On this point, one of his takeaways for the audience was that “It is not always necessary to complete Treasury 2.0 and 3.0 before moving on to Treasury 4.0. Technology has evolved to such a level that it is no longer necessary to wait. As long as you have the fundamentals in place, such as clean data, you can start preparing for Treasury 4.0 today.”



# Getting ready for Treasury 4.0



## Panellists:

**Carmen Gay**, CTP, Director of Corporate Cash Management, Anadarko Petroleum Corporation

**Witland LeBlanc**, VP, Head of Corporate Treasury and Tax, Oceaneering International

**Eric Burns**, Assistant Treasurer, Cash & Banking, Marathon Oil

**Kevin Stibora**, Director for Americas TSC and Consulting, HP Inc.

**David Andrada**, Global Sector Head, Natural Resources and Utilities, Global Liquidity and Cash Management, HSBC

**Moderator: Eleanor Hill**, Editor, TMI

A high-powered panel of industry experts carried on this theme during an hour-long discussion, providing concrete examples of Treasury 4.0 technologies in action. The panel began by outlining use-cases for Robotic Process Automation (RPA), with LeBlanc explaining that Oceaneering “Is certainly looking at the potential of bots to improve collections. We also see great potential in using bots to aggregate bank account information, providing greater visibility over company cash, in a much shorter timeframe and with a greatly reduced manual burden.”

Gay is also in the process of exploring the potential of bots, having already created one bot to help with bank account reconciliation. “We would ideally like to build a bot that can pull bank account statements from all of our banks’ portals and file these statements for audit purposes.” Another use case Gay has identified, more specific to oil and gas, is to build a bot that can “Structure tax payments to local authorities in the correct format for each of those organisations, since doing so manually is hugely inefficient.”

Moving on to discuss the potential of artificial intelligence, Stibora concentrated on the potential of AI to improve cash flow forecasting. “AI has the capacity to compute vast swathes of data, and by rolling out machine learning, it is possible to identify cash flow bottlenecks and working capital optimisation opportunities that treasury teams simply aren’t able to see today.”

He continued: “AI is about unlocking hidden value within your treasury processes through automation and data-driven insights that enable the team to be more strategic.” Another tool the panellists believed could help free up the treasury team was Application Programming Interfaces (APIs). Gay explained: “The banks are working on a number of API-based solutions to help treasurers see all of their cash balances in one place, for example. At Anadarko, we are also keen to leverage APIs ourselves, potentially building a KYC Repository of our own that we can permission our banks to access – so that they come to us to pull the documentation they need, rather than us spending time pushing it out to our various banks.”

One of the other Industry 4.0 technologies that the panel discussed was blockchain, or distributed ledger technology (DLT).

Andrada spoke about the potential of DLT to revolutionise the world of global trade, and blockchain-based platforms such as we.trade, which HSBC is pioneering, are already making open account trade safer and quicker for corporates. “Elsewhere, HSBC has used DLT internally for FX transactions – and in 2018, we processed circa \$250bn of cross-currency payments via the blockchain for our own FX settlements. We see great potential to roll this solution out to corporates,” commented Andrada.

As much as all of this innovation is exciting, Burns emphasised the importance of due diligence and value of collaboration across the organisation. In addition to in-depth conversations with consultants and relationship banks to ensure that treasury is choosing the right technology tools, “not just jumping on the bandwagon”, Burns advocated close co-operation with internal teams, especially IT. “Treasury is not an island and cannot function at an optimal level without strong internal partnerships. In the Treasury 2.0 world, we were joined at the hip with our tax and accounting function. In the Treasury 4.0 world, we will have a symbiotic relationship with IT,” he predicted. “Not just in terms of cybersecurity, but in terms of leveraging technology to truly add value to the business.”

The panel also discussed the need for up-skilling treasury teams to make the most of new technologies. Stibora and LeBlanc both spoke about treasury talent of the future, debating whether data science capabilities might become more prized than technical treasury qualifications.

To wrap up, the panellists shared some words of wisdom around moving towards Treasury 4.0. In terms of choosing the right technologies going forward, Burns’ advice to the audience was to consider “flexibility alongside all of the prerequisites such as security, functionality, partnership approach, budget, and management support.” The other panellists were in agreement, with Andrada adding that “Treasury 4.0 is an evolution, a journey, an opportunity to future-proof treasury. It’s not just about improving operations today; it’s about looking for efficiencies tomorrow.”

Andrada closed the panel by explaining HSBC’s intention to co-create further Treasury 4.0 solutions hand-in-hand with clients, observing that “This is an incredibly exciting time to be in treasury – and you have a unique opportunity to shape the future of treasury management, not just for your own organisation, but for the industry as a whole.”



### The World in 2030

Following the lively panel discussion, Nicholas Smithie, Managing Director, Senior GEM Multi-Asset Strategist, HSBC Securities (USA) Inc., gave an insightful presentation based on HSBC Global Research's Report entitled 'The World in 2030'.

The full Research Report makes for very interesting reading and provides the perfect backdrop to any considerations around the adoption of Industry 4.0 and Treasury 4.0 technologies.

### Cybersecurity in a 4.0 world

Last, but by no means least, Charles Henderson, Global Partner and Head of X-Force Red, IBM Security, helped the audience to understand how to stay protected against cyber threats in an increasingly connected world. X-Force Red is an autonomous team of veteran hackers hired to break into organisations and uncover risky vulnerabilities that criminal attackers may use for personal gain.

By sharing off-the-record learnings from his team's engagements with clients, Henderson educated the audience on emerging vulnerabilities arising from converging technologies. He also shared some top tips on staying cybersecure:

**1. When you think of technology use cases, think of "abuse cases" too** – this is how cybercriminals approach systems, and to stay one step ahead, you have to walk in their shoes.

**2. Don't forget to fix what you find.** Highlighting a security flaw doesn't eliminate it. Knowing about the problem is not the battle; fixing the problem is. Make sure it is resolved and stays fixed in the future.

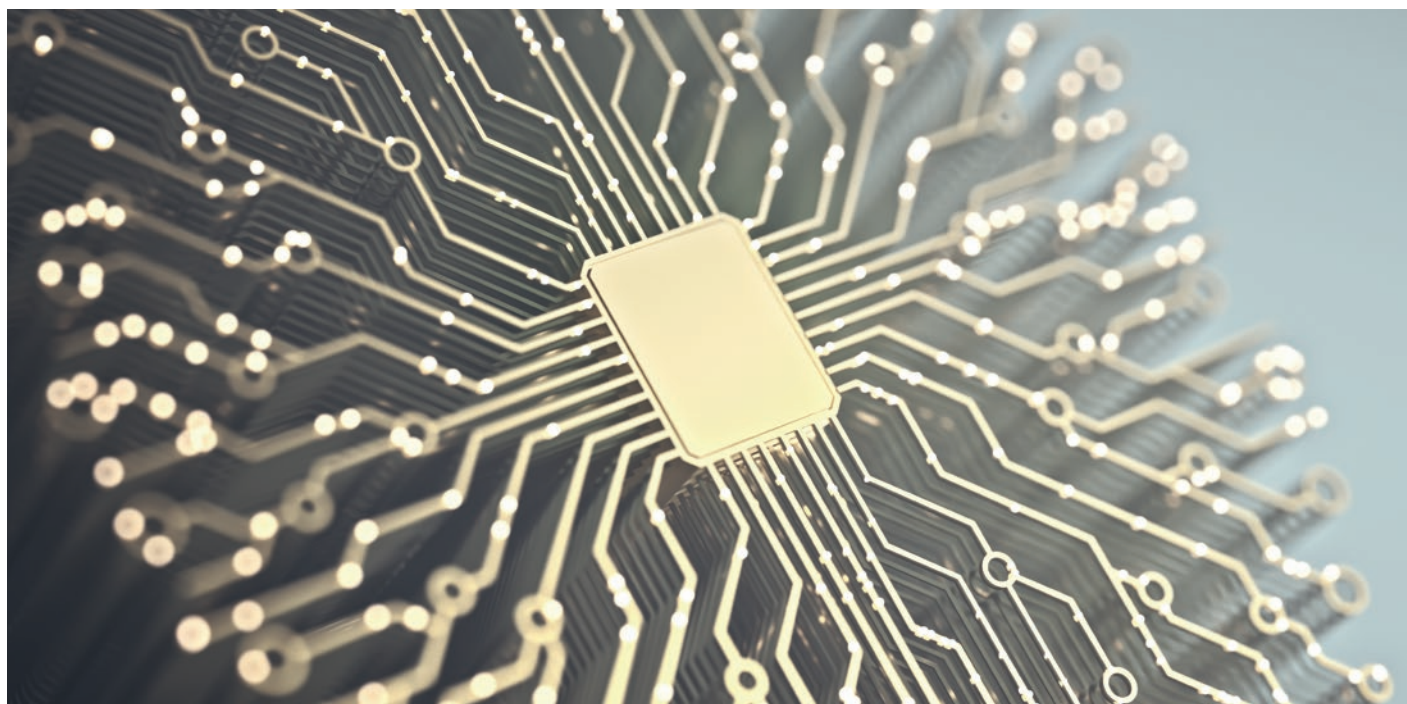
**3. Upgrade your passwords.** 8-character passwords take circa three minutes to crack. Using sentences as passwords is far more secure and a must for systems or apps that give access to sensitive information, not least password storage services.

**4. Embody a speak-up culture.** Robust cybersecurity policies have no inherent worth if individuals do not feel empowered to question instructions or to flag up weaknesses in protocols. People are key in the fight against cybercrime and organisations must encourage them to speak up, with a no-recrimination approach.

### The road ahead

Kawaguchi closed the Forum by explaining that, "As the Fourth Industrial Revolution progresses, HSBC will continue to help treasurers identify concrete applications of Industry 4.0 technology within their treasury function.

"Through upcoming Global Liquidity & Cash Management Regional Roadshows in 2019 and our day-to-day client conversations, we will also bring you insights from Treasury 4.0 champions, including your peers. In addition, we will help you to weigh up the potential risks associated with Treasury 4.0 and outline practical ways to move towards a 4.0 environment, including up-skilling the treasury team. Of course, HSBC will also continue to invest in technology across the bank, with the aim of making things simpler, faster and better for you, our clients," he concluded.







Published: May 2019

For Professional clients and Eligible Counterparties only.

All information is subject to local regulations.

Issued by HSBC Bank plc.

Authorised by the Prudential Regulation Authority and regulated by the Financial Conduct Authority and the Prudential Regulation Authority.

Registered in England No 14259

Registered Office: 8 Canada Square London E14 5HQ United Kingdom

Member HSBC Group